Lithium/polymer battery electrolytes: The poly(ethylene oxide)/lithium perchlorate system

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While both "button" and "shoe-box" lithium/polymer batteries are now commercially available, the transport of lithium ions through the polymer medium is poorly understood. To better understand this transport, our research group at UNLV has used the noninvasive methods of static light scattering and the dynamic light scattering techniques of photon correlation spectroscopy and Fabry-Perot interferometry (Brillouin scattering) to carry out an extensive investigation of the structure and dynamic behavior of highly entangled poly(ethylene oxide) melts with and without dissolved lithium perchlorate. A summary of the results of these light scattering studies will be presented along with those of recently initiated rheological measurements on the same system.